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SOME ASPECTS OF THE ECOLOGY OF
AXYMYIA FURCATA McATEE
 (DIPTERA: SYLVICOLIDAE)¹

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The family Sylvicolidae is commonly referred to as Anisopodidae (or Anisopidae) in the literature and has also appeared under the synonyms of Phryneidae and Rhyphidae. This family has acquired the common name, "false crane flies" or "wood gnats"—the latter from the fact that the larvae are generally inhabitants of wood.

McAtee (1921) established the genus *Axymyia* and described the adult of the species *A. furcata*. Alexander (1942) stated that the adults of the species had been collected only in the states of Massachusetts, New York, Pennsylvania and Virginia, that these collections had occurred during the months of April and May and that this species of fly "is very rare."

The interest in this species arose from the rather unusual appearance of the larva and that it seemed to have both a respiratory tube and gills (Fig. 1). After the ecological studies had been begun it was

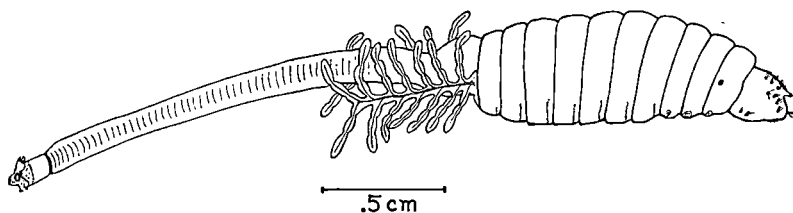


FIG. 1. Lateral view of the last instar larva of *A. furcata*.

noted in the literature that the same larva had been collected from a rotten elm log in Hocking County, Ohio in 1946 and was listed as an "unknown family, genus and species" by Peterson (1953)². Further investigation showed that Alexander (1920) described the last-instar larva of this species (collected from a rotten maple log) as that of the crane fly, *Protoplasma fitchii*, but states that this was done on sup-

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² Grateful acknowledgment is made of the loan of these larvae from Dr. J. G. Rozen, Jr. of Ohio State University.

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position since the adult had not been reared out for verification. In all cases where the larva of this species has been encountered the populations have been very small and attempts at rearing the adult have been unsuccessful.

Only two populations of this species have been located and studied by the writer. These were both in rotten aspen logs lying in rather swampy woodland in the vicinity of the University of Minnesota Forestry and Biological Station in Itasca State Park, Clearwater County, Minnesota. The larvae did not inhabit the portions of the trunks that were covered with bark, mosses or fungi. Also, they were found only in that part of the trunk which was wet enough so that water would appear when a knife blade was inserted or when the wood was squeezed, and where the wood was soft enough to be penetrated for some distance by a pencil. Two species of *Temnostoma* (*T. alternans* and *T. bombylans*) were found boring tunnels in the wood in the same areas as the larvae of *A. furcata*.

The larval stage of *A. furcata* is apparently two years in length. This is suggested by the fact that two constant and highly different instars were present at all times when collections were made during the summer, fall or winter. The caudal end of the respiratory tube remains at the surface of the tree trunk as the larva grows and extends its tunnel into the wood (eventually to a distance of about 1½ inches). During the two years of larval existence it seems to hang

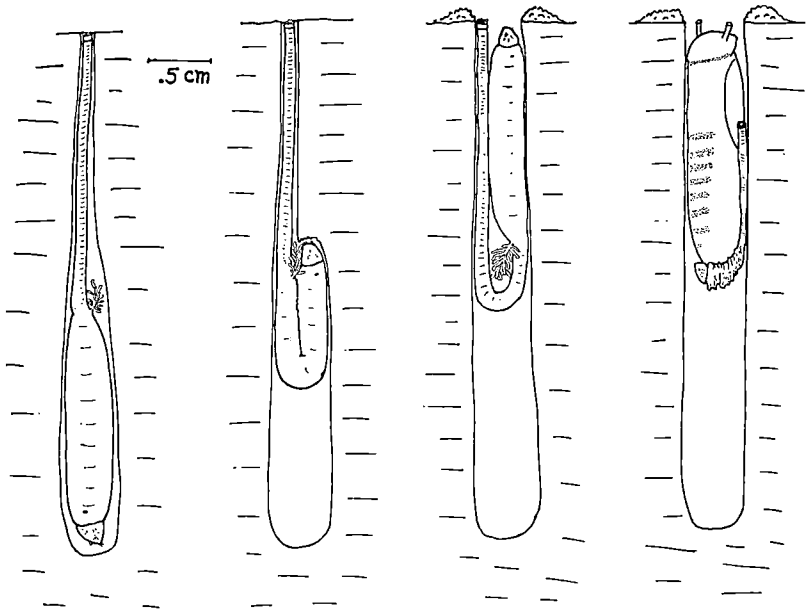


FIG. 2. Positions of larva and pupa of *A. furcata* at different times during its life history. Left, normal position of developing and overwintering larva; Two middle diagrams, larva boring its way to surface of log; Right, pupa and exuvium of larva.

suspended by its respiratory tube (Fig. 2), since it is found only on the dorsal and dorso-lateral aspects of the log. In the middle or latter part of April, the larva doubles back and bores its way out to the surface of the log. At this time the location of the individuals can readily be ascertained because of a small circle of wood borings that appears about the surface opening. This activity also releases the terminal end of the respiratory tube. This is followed by moulting and pupation as shown in Fig. 2 (right). The adults emerge in the latter part of May. The number of instars have not been determined, nor has the pupa been described at this date. A detailed description of larval instars and the pupa will appear in a later publication.

The known distribution of this species can now be extended from that of northeastern United States to include Ohio and Minnesota. Larvae have been collected from aspen, elm and maple logs. It seems that there might be considerable latitude in the kind of tree that might be used by *A. furcata* providing the trunk is properly decayed and moist. It is therefore assumed that this species of fly may well be distributed over a considerable part of the nation, rather than being restricted to the northeastern states. However, after considerable unsuccessful searching for further populations of this species it seems quite logical to continue to regard it as a "very rare species."

The available stages of *Axymyia furcata* McAtee will be deposited with the United States National Museum, Washington, D.C. and with the University of Minnesota, Department of Entomology, St. Paul, Minnesota.

Verification of the species of the adults of *Axymyia furcata* McAtee was made by Dr. A. Stone of the United States National Museum, Washington, D.C. This is gratefully acknowledged.

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